> Step by step 1. Creating an old-school breakbeat with ADM CM

1 > Let's start off by making an old-school breakbeat. We'll insert **ADM CM** onto a new track in Live 9. Our tune will end up at 137bpm, but we'll start with a tempo of **110bpm** so that we can render it to audio and then speed up the break, giving it that sampled feel. Flick ADM CM's **Sync** switch to **Host** then click on the **Power** button on the top edge to select the **Jazzy** preset from the menu. Set the **Shuffle** to **20%**

2 > Press **C2** on your MIDI controller or piano roll to hear the pattern it plays. Let's edit this pattern by clicking the **Ptn Write/Clear** button. We tune the kick and snare drum down to note **A3** so that when our resampled break is sped up, these elements still have some low-end weight. We also add an extra kick to the pattern at positions **8** and **11** and snare at **5** and **13**.

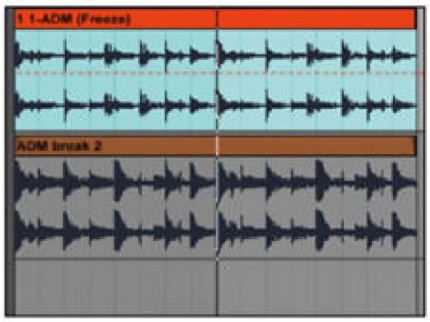
3 > The distinctive style of many breakbeats is achieved using a ride cymbal. We program the ride on the first and then every other position in the sequence at half velocity (indicated by a dark-blue light on the sequence buttons). We also change the sample used to **Ride 1** and turn the **Level** down to **55%**.

4 > At the moment, the beat sounds a bit sterile, unlike a live drum kit played in a real room. To remedy this, we add a little reverb using the standard preset from **KR-Reverb CM** set to **20% wet/dry** mix. We also shape the sound slightly using compressor **CM-COMP 87**, setting its **Threshold** to **-25**, **Ratio** to **1.2** and **Make Up** gain to **5dB**. This emphasises the ride and tightens up the kick a little.

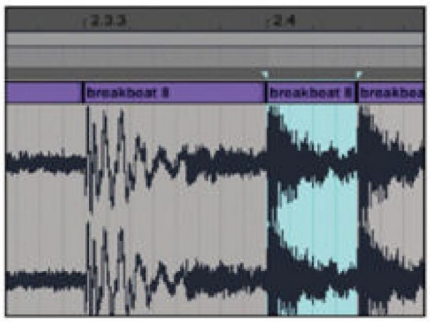
5 > Next, we need to bounce the audio and then speed it up, repitching it in the process. In Live we can first **Freeze** then **Flatten** the track, but your DAW may handle this process differently. We then set the tempo in Live to our desired speed of **137bpm**. Unchecking the **HiQ** option and selecting **Re-Pitch** in Live's Sample pane forces the breakbeat to be pitched upwards.

6 > In old-school hardware samplers, the comparatively low bit depths and sample rates in practical usage caused audible artifacts to be introduced. Let's emulate this with some bitcrushing. **Eurydice CM**'s preset **CM_CrushOnly** is designed specifically for this. We set the **Rate** to **2** and **Bits** to **16** to introduce some crunch to our break.

7 > Let's introduce a little distortion to our breakbeat to suggest some slight analogue clipping of the original signal chain. **Ohmygod!**'s Distortion module is perfect for this, so we set it to **3.5 dB**. Turning the Comb Filter's **Feedback** to **0** kills the plugin's comb filtering, which we don't need here. We also add an instance of channel-strip plugin **Satson CM**, set to **+3dB** for a bit of warmth and saturation.



8 > Due to polyphony and RAM limitations of old-school samplers, sometimes multiple samples would be combined and then sampled again. We'll emulate this by using a second dirty breakbeat (**ADM Break 2.wav**), which we've processed similarly to the first. We load it into Live, export the two breakbeats as a single WAV file and then reimport the sample back into our project, deleting the originals.



9 > To get the most out of a short sampled loop, producers would sometimes chop their sample into small sections to be manipulated individually. We can do the same with our breakbeat – chop out the final kick drum and snare at 2.3.3 and 2.4 and use Live's **Transpose** dial in the Sample pane to re-pitch each hit. Voila! A dirty old-school break ready to form the backbone of our tune.

> Step by step 2. Programming a hoover synth noise

1 > The hoover lead is an old-school trademark, and we can mimic it using a soft synth. On a new track, set **Dune CM**'s **Init** patch to play **Lead Hoover.mid**. Set a **Saw** wave for OSC 3 and OSC 1 and detune OSC 1 by **-12 Semi**tones. Select **Square** for OSC2 at **-24 Semi**tones and choose a 50/50 mix for OSC 1 and 2. We also increase the **Noise** dial to **5%**.

2 > Next, let's thicken up the sound. Firstly, we move the **Fat** knobs for OSC 1 and 2 to **50%**. Then we increase the **Voices** dial to **4**, **Detune** to **20%** and stereo **Spread** to **50%**. This newly thickened patch now sounds really fat. The original hoover sound came from a patch on the Roland Alpha Juno synth, and it had a distinctive pitch modulation – let's program that too.

3 > We access the Mod Matrix panel and set **Source** to **Mod Env**, **Amount** to **-20** and **Destination** to **Other » Pitch Semi**. Now when we change the Mod Envelope's **Attack** to **30%**, we get a fast pitch 'bounce' effect at the beginning of each note. Clicking the **Mono** button and setting **Glide** to **70%** also gives us a pitchbend between legato notes.

4 > To add crunch and weight, we'll use **Ohmygod!** We reduce the Comb Filter's **Feedback** to **0** and set the distortion **Amount** to **6.0dB**. Live's default **Chorus** effect is added to make our hoover nice and juicy, but you can use any chorus you like. Finally we add **Satson CM**, set to **+6dB Gain**, simulating an analogue mixing desk signal path.

Crushing the bits

Sampling has come a long way since the introduction of the first commercial sampler in 1976. Coincidentally, it was called the 'Computer Music Melodian' but wasn't a huge success. Its measly 12-bit, 22kHz resolution was superseded three years later by the ubiquitous Fairlight CMI with its impressive 16-bit, 100kHz specs. The golden age of sampling came soon after, with producers using affordable hardware from manufactures like Akai to slice and dice existing records into their own creations.

If you're considering using samples in your vintage tracks, consider first whether a sampler had even been invented during your chosen era, and secondly the kind of sound it would create.

Some quirks of using hardware samplers include lowering bit depth and sample rates to save memory (replicated easily using a bitcrusher plugin), and artifacts introduced by primitive timestretching algorithms – Akai's famous Cyclic mode can be mimicked using the Akaizer Project software at bit.ly/ZdB1Fh to get that metallic jungle/hardcore feel.

The Akai S950's timestretching algorithm introduced artifacts that can be recreated in a DAW with software

> Step by step 3. Wavering analogue bass

1 > Here we're going to create a wobbly sine wave bass, as if it's being created using detuning effects on a temperamental hardware synth. We're using the supplied MIDI file **Bass.mid** in **Dune CM**. We load the **Init** patch and set OSC 1 to a sine wave. We also add **1% Noise** and set **Colour** to **80%**, mimicking an analogue noise floor.

2 > To achieve the unpredictable wavering, pulsing sub bass heard on countless 90s rave and hardcore classics, we're going to use multiple voices and detune them quite heavily. We increase the **Voices** dial in the Unison panel to **3** and push **Detune** to **70%**, which seems to do the trick.

3 > Finally, we copy and paste the **Ohmygod!** and **Satson CM** plugins from our hoover lead onto the sub bass track. The final effect we're after is subtle as we don't want to ruin a nice solid bassline with lots of crazy modulation. We reduce the **Distortion** in Ohmygod! to **2.0dB** and change the **Gain** to **+3dB** in Satson CM.

Sound research

In our track, we've focused on the sounds and production techniques of an early 90s rave track, but whatever era you're shooting for, knowing the specific sounds, synths and techniques of your chosen era is very important, helping you get to grips with the tools and practice of the time and keep your chosen elements authentic.

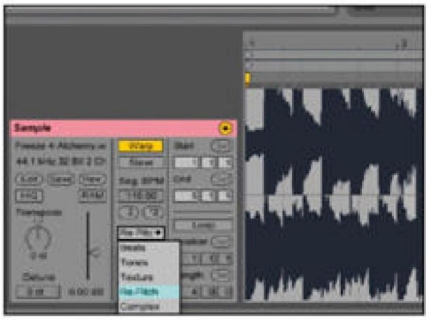
There are a number of resources that can help with this. For info on synths, head to vintagesynth.com, which lists all the major models by year since 1969, along with audio and video clips. For other studio gear, the guide at bit.ly/1bBZcp0 is useful. For more in-depth research, check out the Audio Engineering Society (aes.org) and historyofrecording.com, both of which have a huge number of archived resources. You could even plunder back issues of cm for guides to the most popular techniques of yesteryear!

Remember to check whether certain effects had been 'discovered' before your chosen era; an obvious example would be avoiding the use of Autotune if your track is supposed to sound like its from before the late 1990s. However, other things such as not writing polyphonic riffs with sounds typical of monosynths are easy to overlook when you have the power and flexibility of a modern soft synth at your disposal.

> Step by step 4. Classic sped-up rave piano riffs

1 > We'll write our piano riff at a lower BPM, as if it's been sampled from a house tune, then speed it up. We lower our project tempo to **110bpm** and bash out a house-style riff (**Piano.mid**) using **Alchemy CM**'s **Gran Piano** preset. We've imagined this piano as crafted using a basic tracker, so all notes are maximum velocity with strict quantisation.

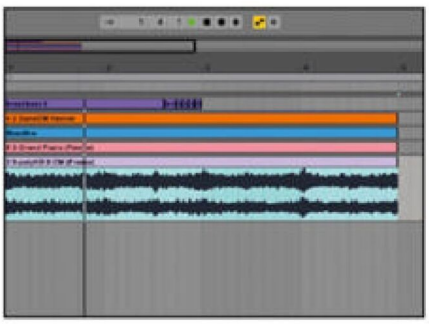
2 > We turn all effects dials to **0** in Alchemy CM and set its **Release** to **12 o'clock**. As we want to emulate the sound of a Korg M1 piano, we add Live's **Chorus** effect with **Delay 1** set to **0.30ms**, **Delay 2** set to **0.01ms** and the **Dry/Wet** mix to **50%**. We also add **Satson CM** with its **Gain** set to **7dB** and its **High Pass** at **100Hz**, adding some warmth and taming the low end.

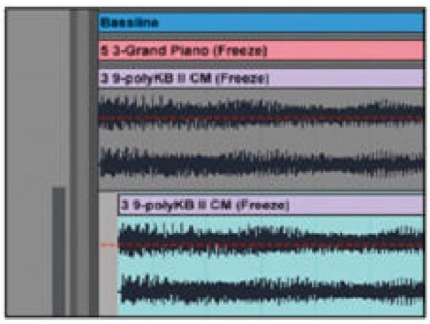


3 > We **Freeze** and **Flatten** the audio, creating a new sample, and return our tune's speed to **137bpm**. Turning off the **HiQ** button and selecting **Re-Pitch** in Live's Sampler window pitches up our piano so that it's in tune with the rest of the track. We've worked out this tuning in advance, but for your own tracks, you can use the handy tempo/pitch calculators at **bit.ly/qIoHws**

4 > Our piano sounds a little dull, so we'll bring out the presence with some EQ. Using **CM-EQUA 87**, we set the midrange **MF** dial to **500Hz** with a **Q** of **1.80** and a **G**ain of **-4dB**. For the high end, we set the **HF** dial to **7kHz**, **Q** to **2.00** and **G**ain to **+5dB**, bringing out the sparkle of the piano. We also add a delay with **KR-Delay**, set to Link mode, a **Sync**ed 1/8 delay with a **10% Dry/Wet** mix.

> Step by step 5. Making super-wide stereo synth strings





1 > This is an old-school effect used to create stereo width. We load **PolyKB II CM** on a new track playing **Strings.mid** and select the preset **Strings » Sustenuto Pad CD**. To simulate the voice limitations of old-school synths, we change **Nbr Voices** to **3**. We set the ADSR1 and ADSR2 **Attack** to **0** and **Filter Frequency** to **70**.

2 > Using **Satson CM**, we set a gain of **+3dB** to add mixer channel-style saturation and then **Freeze** and **Flatten** the track, creating a new audio file. We chop off the long release tail of the waveform, which we won't be needing.

3 > Next we duplicate this sample onto another track and reduce both by **5dB** to prevent clipping. We pan one track hard left and the other hard right, effectively creating two mono tracks. Then we offset the position of one by a 64th-note, utilising the Haas effect, resulting in a wide stereo sound.

Mixing and mastering

For the final walkthrough of our short track, we'll create a mixdown in a retro style. This stage is a little more challenging to get to grips with, as opposed to creating the individual tracks of our mix.

The first thing to remember is the signal chain of the audio. Typically, it would have been output in analogue from the various synths and samplers used in the track's creation, fed into a mixer, bussed out to hardware effects, routed back into the mixer and then output for recording.

The amount of effects and channels would be limited, so when putting together your own tracks, don't set up too many busses for effects or parallel processing.

90s producers would integrate more outboard gear than we would today, but in budget home studios, there may have been only one unit available to provide each type of effect. Owning a single reverb, delay and compressor, for example, meant you could only use each once per bounce/mixdown, and any instruments using it would be subject to the same settings.

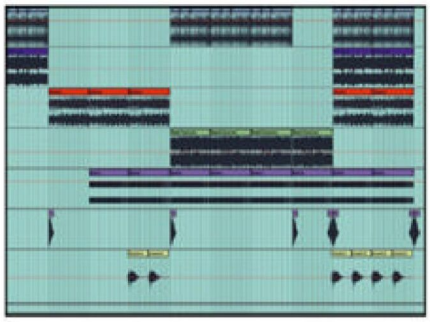
In addition, every time the audio was fed through the mixer, it would pick up a tiny bit more noise and perhaps suffer crosstalk – a slight 'bleeding' of audio between mixer channels. The number of mixer channels itself would have also been an issue. While using tape to bounce tracks and free up units wasn't so common in early 90s dance production, producers might instead resample sections of their own track into a sampler to free up synths and effects for other uses. Like bouncing to tape, this would degrade audio with each bounce.

"Owning a single reverb, delay and compressor meant you could only use each once per bounce"

Finally, pressing to a domestic format like vinyl would have had a number of sonic effects. These days, vinyl pressings are normally produced from the same digital masters as CDs; however, historically, mastering for vinyl was different. As well as being quieter, the available dynamic range was smaller: close to 50dB compared to roughly 80dB in digital systems. This often resulted in additional compression being used. Stereo vinyl pressings would also have a mono bass response below around 200Hz due to the physical limitations of the medium.

> Step by step 6. Getting a vintage rave mixdown

1 > We now have a breakbeat, bass, lead, piano and strings, and next we're going to use them all together in a simple track, mixed and processed in a distinctly old-school way. To simulate mixing with just a few channels, we've bounced out these stems prior to constructing the track. You can find these in the **Tutorial Files** folder. We construct a basic arrangement using all the elements.



2 > Creating a retro feel is not just about the correct production techniques but also using samples and sounds that are characteristic of the appropriate era. We've found a rave-style vocal and cymbal from an old **cm** sample pack, and we add them to the track. We also reverse the cymbal in Live to spice up a couple of sections.

3 > Even though we've already used **Satson CM** several times to warm up and saturate individual tracks, we're going to use it again on the whole mix now. We place an instance on the master channel with a **Drive** setting of **+1dB**. An old-school mix like this probably wouldn't sound quite so fizzy, so we adjust the **Low Pass** EQ dial in Satson to **16kHz**, taming some top-end hiss.

4 > Now for the secret weapon! We're using the free iZotope Vinyl plugin from **bit.ly/15VTyC** to emulate a pressing to vinyl, complete with all the noise that introduces. The effect we're going for here is subtle as we don't want to destroy our track with aggressively obvious processing and excessive artifacts.

5 > Firstly, we set the **Year** dial to **2000** and **RPM** to **33**. These two dials are designed to emulate the characteristics of old-school vinyl production years and speeds. As you step back through the years, the bass and treble reproduction diminishes, ending up with an almost band-pass-like effect at 1930.

6 > We introduce noise to the playback with the sliders, setting **Mechanical Noise** to **-15dB**, **Electrical Noise** to **-20dB** and **Dust** to **0dB** with the **Amount** dial underneath set at **80%**. That's quite a lot of noise in total, but we want to make the effect obvious for our demo. Feel free to dial back your settings to create the perfect dirty old-school effect. **cm**